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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,922	01/15/2004	Chris J. Newburn	42P17410	1517

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EXAMINER

BATAILLE, PIERRE MICHE

ART UNIT	PAPER NUMBER
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2186

DATE MAILED: 11/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/759,922

Applicant(s)

NEWBURN ET AL.

Examiner

Pierre-Michel Bataille

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1- is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/1/06</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 4-5, 12-14, and 17-18 are rejected under 35 U.S.C. 102(e) as being anticipated by US 2003/0131184 (Kever et al).

With respect to claim 12, Kever discloses a method comprising: compressing one or more of a plurality of cache lines to form one or more cache lines (**compressing at least one of the lines of data**); updating a compression map within a memory controller to indicate the one or more cache lines corresponding to a block of data in a system memory are in a compressed format (**pointing to the subsection using a tag array structure, the tag structure including entries to represent lines of data that are present in the data array, the cache holding line retrieved from main memory**)[Abstract; par. 0006, 0019-0020].

With respect to claims 4 and 17, Kever discloses a central processing unit (CPU) having: a CPU core; a computer system comprising cache memory having a plurality of cache lines, each of the plurality of cache lines being compressible to form compressed

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cache lines to store additional data (**increasing the storage capacity of a cache data array by storing compressed lines of data in the array**) par. 0018); and compression/decompression logic; and a memory controller coupled to the CPU having a compression map to indicate whether a cache line corresponding to a block of data in a system memory is in a compressed format (**control structure with a tag array structure, the tag structure including entries to represent lines of data that are present in the data array, the cache holding line retrieved from main memory**)[**Abstract; par. 0006, 0019-0020**].

With respect to claim 13, Kever discloses storing the compresses cache lines in cache memory [**increasing the storage capacity of a cache data array by storing compressed lines of data in the array**) par. 0018].

With respect to claims 5, 14, and 18, Kever discloses updating the compressed map comprises updating a status bit associated with the block of data (**compression indicator used to indicate a compression status for a line of data stored in the corresponding subsection, the indicator used to indicate whether or not the corresponding line of data 226 is compressed**) par. 0026].

### **Claim Rejections - 35 USC § 103**

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 6-11, 15-16, and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kever in view of US 2002/0040413 (Okada et al).

With respect to claims 6-11, 15-16, and 19-23, Kever discloses the invention as claimed, but fails to specifically teach the compression/decompression engine temporarily store cache data line prior to the data being compressed or the data being passed from the CPU core to the cache memory. However, Okada discloses a host interface unit for inputting and outputting data from and to a host, a cache memory for temporarily storing the input data (*corresponding to the companion cache as claimed*), a compression/decompression unit for compressing or restoring the input data and outputting the data, a buffer memory for temporarily storing the compressed data (*corresponding to the cache storing compressed data as claimed*) outputted from the compression/decompression unit (Abstract; Par. 000025-0029; 0160). Therefore, it would have been obvious to one having ordinary skill in the art and having both references before him/her at the time of the invention to have used a companion cache as the companion cache would have permitted the data available in an uncompressed format, making the data accessible at a low latency.

### **Conclusion**

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 2005/0114601 (Ramakrishnan) teaches apparatus for a compression architecture utilizing internal cache residing in main memory, the main memory comprising a compression cache, a compressed memory to store a plurality of compressed data and a compressed memory pointer table (CMPT) to store a plurality of pointers.

US 2003/0217237 (Benveniste et al) teaches computer system and corresponding method for supporting a compressed main memory includes a processor, a processor cache, a memory controller, a compression translation table entry register, a compression translation table directory in signal communication with the compression translation table entry register, and a compressed main memory wherein the memory controller manages the compressed main memory and the processor cache.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pierre-Michel Bataille whose telephone number is (571) 272-4178. The examiner can normally be reached on Mon-Fri (8:00A to 4:30P).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew M. Kim can be reached on (571) 272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Pierre-Michel Bataille  
Primary Examiner  
Art Unit 2186

November 10, 2006